

Developing a new test to identify consolidation-related memory markers of normal ageing and Alzheimer's Disease

Michael Craig¹, Mario Parra Rodriguez², Javier Escudero¹, Shannon Strickland¹,
Michaela Dewar¹

¹ *Heriot-Watt University, Edinburgh, UK*

² *University of Strathclyde, Glasgow, UK*

Background: For newly encoded memories to be remembered, they must be consolidated. Research suggests that severe memory problems in AD are due, at least in part, to a fault in awake consolidation, which becomes increasingly vulnerable to interference from post-encoding sensory input. Importantly, post-encoding awake quiescence (quiet rest) strikingly reduces forgetting in AD because it provides conditions that are conducive to consolidation. However, it remains poorly understood how awake consolidation changes ‘normally’ with increasing age and how this differs from AD-related changes. The aim of this study was to develop a new test that can measure normal age-related and pathological AD-related changes in awake consolidation.

Method: A new memory discrimination test was applied in healthy younger (N=40) and older (N=40) adults. Participants completed an incidental encoding task, where they were presented photos of everyday items, before experiencing a 10-minute delay condition of either (i) awake quiescence or (ii) ongoing sensory input. They then completed a visual memory discrimination test for the earlier presented photos. Older adults also completed a battery of neuropsychological measures.

Result: Performance in the memory discrimination test was significantly poorer in older than younger adults. There was a significant main effect of delay condition because both younger and older adults who rested outperformed those who experienced ongoing sensory input. No significant interaction between age group and delay condition was observed.

Conclusion: Despite age-related declines in memory performance, the magnitude of the consolidation interference effect was comparable in younger and older adults. This indicates that a stark increase in consolidation interference is unlikely to be accounted for by normal ageing and there is potential for consolidation interference to be used as a cognitive marker of AD.